

Remarks

Prior to this Amendment, claims 1-23 were pending in this application. All claims were rejected. Claims 1-5, 7-14, 16-20 and 23 have been amended in various particulars as indicated hereinabove. Claims 21 and 22 have been cancelled without prejudice or disclaimer. New claims 24-27 have been added.

Claim Objections

Claims 1, 4, 5, 8, 10, 13 and 14 were objected to because of informalities. Claim 19 was also said to be objected to because of informalities (Office Action, page 2); however, it appears that the objection was actually directed to claim 17 (Office Action, page 5). Accordingly, claims 1, 4, 5, 8, 10, 13, 14 and 17 have been amended to overcome the objections.

Claim Rejections – 35 USC § 112, 1st paragraph

Claims 1, 8, 10 and 17 were rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This rejection is respectfully traversed for the following reasons.

The Examiner has stated, for each of the rejected claims, that “determining a measure of the graphical output as a function of at least a parameter relating to the heat sink temperature for each of the several printed regions measured in a zone of each region where the graphical output was printed in a thermal steady state” is not supported in the specification. Rather, the Examiner contends that the specification does not show a functional relationship between a measure of the graphical output and a parameter relating to the heat sink temperature. “Only functional relationships among a measure of the graphical output, the excitation time or energy and the heat sink temperature ... are shown.” Office Action, pages 6-8.

In response, Applicant notes that the heat sink temperature itself is a parameter relating to the heat sink temperature. The published application, in paragraph 44, discloses that “The graphical output of the calibration printout can be linked with the excitation used on the heater element and the heat sink temperature, if necessary supplemented with additional parameters (e.g. thermal medium humidity).”

Paragraph 48 of the published application further discloses the relationship between a measure of the graphical output and a parameter relating to the heat sink temperature.

Applicant thus contends that claims 1, 8, 10 and 17 as currently amended comply with the requirements of 35 U.S.C. §112, first paragraph, and respectfully requests the withdrawal of rejections of these claims on these grounds.

Claim Rejections – 35 USC § 112, 2nd paragraph

Claims 1-5, 7-14 and 16-19 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4, 5, 8, 13, 14, 17, 19, 21 and 23 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner states that these claims use vague and indefinite terms.

Claims 1-5, 7-14 and 16-19 and 23 have been amended to remedy the deficiencies pointed out by the Examiner, where relevant. We therefore contend that presently amended claims 1-5, 7-14 and 16-19 and 23 comply with the requirements of 35 U.S.C. §112, second paragraph and respectfully request withdrawal of these rejections. Claim 21 has been canceled.

Support for the amendments to claims 4 and 14 can be found at paragraph 77 of the published application. Support for the amendments to claims 8 and 17 can be found at paragraphs 83-85 of the published application.

Claim Rejections – 35 USC § 101

Claim 22 has been rejected as being directed to non-statutory subject matter. While Applicant does not concur with this rejection, claim 22 has been canceled without prejudice to expedite prosecution.

Claim Rejections – 35 USC § 103

The present invention is directed to the field of thermography.

Thermography is concerned with materials which are not photosensitive, but are sensitive to heat or thermosensitive and wherein imagewise applied heat is sufficient to bring about a visible change in a thermosensitive imaging material, by a chemical or a physical process which changes the optical density.

Published application, paragraph 4.

An objective of the present invention is to provide a heat sink temperature compensation algorithm in a thermographic print head. It is a further objective of the present invention to make less assumptions than in prior art compensation algorithms, but to try to model the process more accurately based on the real properties of the image forming material and the print head's construction. Published application, paragraphs. 41-42.

Claims 1-5, 7, 10-14, 16, 22 and 23

Claims 1-5, 7, 10-14, 16, 22 and 23 were rejected under 35 U.S.C. 103(a) as being unpatentable over Lukis et al. (U.S. Patent 5,661,514) in view of Meeussen et al. (U.S. Patent 5,664,893) and further in view of Stephany et al. (U.S. Patent 5,519,419). This rejection is respectfully traversed for the following reasons.

Lukis et al. is silent with respect to the construction of a thermal head and more particularly the presence of a heat sink, the influence of the heat sink upon the performance of the thermal head and the influence of the construction of the thermal head upon the performance of the thermal head in general.

Meeussen et al. has the following objectives:

It is an object of the present invention to provide a thermal printing system comprising an accurate estimate for the temperature of the thermal print element.

It is a further object of the present invention to provide an improved method to accurately estimate the temperature of the thermal print element.

Meeussen, col. 2, lines 6-14.

Meeussen addresses the general problem of the effect of the construction of the thermal head upon the characteristics of the printed images. Therefore, one skilled in the art could use Meeussen et al. from which to attempt to solve the problem of the influence of the thermal head construction upon the performance of the thermal head. However, the approach taken by Meeussen is entirely different from that of Applicant's claimed invention; for example, although the construction of the thermal head includes a heatsink, Meeussen addresses the temperature of the thermal print elements rather than the temperature of the heatsink. See, for example, Meussen claims 1, 7 and 8. Meeussen provides no hint or indication of an alternative method for solving the problem of the adverse effect of the construction of the thermal head upon the characteristics of the printed images.

On the other hand, the present invention as recited in currently amended claim 1 provides an alternative solution to the problem of the adverse effect of the construction of the thermal head upon the characteristics of the printed image.

Referring again to Lukis et al., Lukis discloses "a method and apparatus for controlling thermal printers, preferably to form binary images. More particularly, [Lukis] relates to a method and apparatus for selectively positioning boundaries between active and inactive areas of an image." See for example Lukis et al., col. 1, lines 11-15.

This is unrelated to the influence of the thermal head construction upon printing performance. Applicant therefore contends that one skilled in the art would have no

motivation for combining the teaching of Lukis et al. with that of Meeussen et al. with a view to solving the problem of the adverse effect of the construction of the thermal head upon the characteristics of the printed image.

The Examiner suggests that one skilled in the art would combine the teaching of Stephany et al. with that of Meeussen. Stephany et al. belongs to the art of thermal ink-jet printing in which a thermal impulse is used to cause a mini-explosion in the ink-jet ink-supply such that ink is ejected onto a distant ink-jet receiving material. This is an entirely different technical problem than that present in thermal head printers in which heating elements are in direct contact with a thermally sensitive material and in order to realize an acceptable resolution i.e. 300 dpi or better the distance between individual heating elements is correspondingly small resulting in the heating of a particular heating element being influenced by prior heating of adjacent heating elements. Stephany “relates to a spot-size control system for a thermal ink jet printhead.” Stephany et al. at col. 1, lines 9-10. Finally, contrary to the Examiner’s assertion that Stephany teaches determining a measure of the graphical output as a function of a parameter relating to a heat sink, *Stephany does not even appear to discuss a heat sink.*

It is clear that Stephany is not even remotely related to the situation existing in thermal head printers and bears no relationship to the problem solved by the present application, namely compensating for the adverse effect of the construction of the thermal head upon the characteristics of the printed image.

Applicant therefore asserts that the claimed invention would not be obvious to one of ordinary skill in the art having Lukis, Meeussen and Stephany before him. The combination of these references, even combined with the knowledge of one of ordinary skill, would not yield the claimed invention. Applicant thus contends that claims 1-5, 7, 10-14, 16, and 23 are patentable under 35 U.S.C. §103(a) over Lukis et al. (US 5,661,514) in view of Meeussen et al. (US 5,664,893) and further in view of Stephany et al. (US 5,519,419) and respectfully requests withdrawal of the rejection of these claims in favor of allowance. As discussed previously, claim 22 has been canceled.

Claims 6 and 15

Claims 6 and 15 were rejected under 35 U.S.C. 103(a) as being unpatentable over Lukis *et al.* (U.S. Patent 5,661,514) in view of Meeussen *et al.* (U.S. Patent 5,664,893) and further in view of Stephany *et al.* (U.S. Patent 5,519,419) and Carnahan *et al.* ("Applied Numerical Methods," John Wiley and Sons, 1969). This rejection is respectfully traversed for the following reasons.

Applicant contends that since claims 1-5, 7, 10-14, 16 and 23 are patentable under 35 U.S.C. §103(a) over Lukis et al. (US 5,661,514) in view of Meeussen et al. (US 5,664,893) and further in view of Stephany et al. (US 5,519,419), and Carnahan et al. only discloses applied numerical methods for which there is no motivation in Lukis et al., Meeussen et al. or Stephany et al., claims 6 and 15 are patentable under 35 U.S.C. §103(a) over Lukis et al. (US 5,661,514) in view of Meeussen et al. (US 5,664,893) and further in view of Stephany et al. (US 5,519,419) and Carnahan et al. ("Applied Numerical Methods", John Wiley and Sons, 1969).

In any event, allowance of claims 6 and 15 follows from the allowability of their respective base/intervening claims 1 / 4; and 10 / 13, discussed above.

Claims 9 and 18

Claims 9 and 18 were rejected under 35 U.S.C. 103(a) as being unpatentable over Lukis *et al.* (U.S. Patent 5,661,514) in view of Meeussen *et al.* (U.S. Patent 5,664,893) and further in view of Stephany *et al.* (U.S. Patent 5,519,419) and Haraguchi *et al.* (U.S. Patent 6,002,498). This rejection is respectfully traversed for the following reasons.

Haraguchi et al. is in the field of image processing of colored images comprising mixtures of dyes and bears no relationship to the problem solved by the present application, namely an alternative solution to the problem of the adverse effect of the construction of the thermal head upon the characteristics of the printed image. The problems addressed by Haraguchi et al as disclosed at col. 4, lines 23-41, are:

An object of the invention is to obtain, through simple operation, analytical density representing an amount of a color dye with which a print can reproduce colors of a color image with high fidelity, in the case wherein a color image is read by an image reading apparatus in a way of reflected light and a print is made by an image forming apparatus based on spectral density the color image read by the image forming apparatus in the wavelength region of each primary color.

Further object of the invention is to solve the problem that analytical density obtained in a low density area or a high density area in particular does not agree with actual analytical density because a ratio of secondary absorption density to primary density of dyes for subtractive color process varies due to an influence of scattering in the case of a reflection original image depending on the primary density of the dyes for subtractive color process, and to make the color reproduction with high fidelity possible through simple operation.

Applicant contends that since claims 1-5, 7, 10-14, 16 and 23 are patentable under 35 U.S.C. §103(a) over Lukis et al. (US 5,661,514) in view of Meeussen et al. (US 5,664,893) and further in view of Stephany et al. (US 5,519,419) and Haraguchi et al. is in the field of the image processing of colored images comprising mixtures of dyes, claims 9 and 18 are patentable under 35 U.S.C. §103(a) over Lukis et al. (US 5,661,514) in view of Meeussen et al. (US 5,664,893) and further in view of Stephany et al. (US 5,519,419) and Haraguchi et al. (US 6,002,498).

In any event, allowance of claims 9 and 18 follows from the allowability of their respective base claims 1 and 10, discussed above.

Claims 19-21

Claims 19-21 were rejected under 35 U.S.C. 103(a) as being unpatentable over Lukis *et al.* (U.S. Patent 5,661,514) in view of Stephany *et al.* (U.S. Patent 5,519,419). Claim 21, now canceled has been combined with claim 19. The rejection of claims 19 and 20 is respectfully traversed for the following reasons.

The Examiner has rejected claims 19-21 as being unpatentable under 35 U.S.C. §103(a) over Lukis et al. (US 5,661,514) in view of Stephany et al. (US 5,519,419).

As discussed previously, Lukis is silent with respect to the influence of a heat sink upon the performance of a thermal head, while Stephany belongs to the art of thermal ink-jet printing in which a thermal impulse is used to cause a mini-explosion in the ink-jet ink-supply such that ink is ejected onto a distant ink-jet receiving material.

Neither Lukis nor Stephany would be remotely considered by one of ordinary skill in the art as starting points from which to address problems concerning the influence of the thermal print head construction upon the characteristics of the printed image, and further, the combination does not teach the invention as claimed.

We therefore contend that one skilled in the art would not be motivated to consider the teaching of either or both of these documents that the inventions of claims 19-20 are patentable under 35 U.S.C. §103(a) over Lukis in view of Stephany, and respectfully request withdrawal of the rejection of these claims in favor of allowance.

Conclusion

Claims 21 and 22 have been canceled. New claims 24-27 have been added. Support for new claims 24 and 25 can be found in paragraphs 161 and 256 of the published application.

Support for new claim 26 can be found in paragraph 146. Support for new claim 27 can be found in paragraph 48. In fact, Meeussen teaches away from the invention as recited in claims 26 and 27 (for example, “In neglecting temperature gradients within the solid . . .,” Meeussen, column 7, lines 41-43).

No new matter has been added. For all of the above reasons, Applicant contends that the presently amended application is in a condition for allowance.

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It is believed that the present application (claims 1-20 and 23-27) is in condition for allowance. A Notice of Allowance is respectfully solicited. Should any questions arise, the Examiner is encouraged to contact the undersigned.

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